

Considerations for Elderly Persons with Diabetes



Diabetes continues to be a disease that disproportionately affects the elderly. In Texas, approximately 16.3% of people over age 65 have been diagnosed with diabetes, compared to approximately 8.1% of the overall population (BRFSS, 2003). Older adults with diabetes are more likely to experience complications from diabetes, thus, elderly patients with diabetes generate most of the costs of treating complications.

In particular the goals for treatment of the elderly person with diabetes should include:

1. Improving or maintaining health and functional status of the elderly with diabetes by maximizing glucose control.
2. Early detection and treatment of the complications of diabetes through organized, pro-active screening efforts.
3. Aggressive treatment of co-morbid risk factors, specifically hypertension and dyslipidemia.
4. Careful monitoring of therapy to avoid common problems in the elderly: polypharmacy, adverse drug events and inappropriate medication use.

Given that these goals are similar to those for treatment of diabetes in any age group, the patient's stage in the disease process and their co-morbid conditions rather than age alone are most important in determining the appropriate course of treatment. The Council supports the basic recommendations summarized in the *Minimum Practice Recommendations* flow sheet with modifications that consider issues for elderly populations.

Health care providers and payers, including managed care organizations, should adopt the Texas Diabetes Council's *Minimum Practice Recommendations* as the basis for managing diabetes in elderly patients.

Clinicians should strive to achieve the same levels of glycemic control (blood glucose, A1c), blood pressure and lipid control in elderly patients with diabetes as in younger ones. Targets may be modified in light of advanced complications, life-limiting co-morbid illness, or severe cognitive or functional impairments.

Given the high risk of secondary complications among elderly patients with diabetes, such as cardiovascular disease and lower extremity complications, clinicians should screen aggressively for and treat secondary complications.

Foot screening conducted at every visit includes not only visual inspection for lesions, infections, and calluses, but also assessment of pulses and use of monofilaments to further screen for neuropathy.

At each office visit, the clinician should specifically inquire about and consider comorbidities and the risks associated with polypharmacy, common problems in the elderly. Increased attention may be necessary in selecting and monitoring drug therapy in the elderly; for example, metformin may be contraindicated because of renal disease or heart failure.

Diabetes self-management education for the elderly should take into account special instructional needs:

- A) Elderly patients should be encouraged to include their caregiver or a family member in all educational sessions
- B) Educational materials and methods should consider vision impairment, mobility, dexterity, mental state, functional status, and financial resources.
- C) Elderly patients should be educated about possible effects of multiple medications and how concurrent illnesses may affect their treatment, self-care, and disease progression.
- D) Preventing long-term complications of diabetes should be stressed.

Physiologic Changes in Glucose Metabolism

The elderly are prone to glucose intolerance and thus are at higher risk for developing diabetes. Fasting plasma glucose increases 1–2 mg/dl and the 2-hour postprandial glucose increases on average 8–20 mg/dl per decade of age after the age of 30–40 years. The changes to glucose intolerance have been attributed to age-related defects, post receptor defects in insulin action with decrease in velocity of glucose transport and/or other post receptor defects. There is also a depletion of intracellular pool of transporters or a defect in insulin-mediated translocation to the plasma membrane, along with impairment of the intracellular glucose metabolism beyond the defect in transporters.

Diagnostic Criteria and Goals

The diagnostic criteria and goals of therapy remain the same throughout the lifespan.

- ◆ Maintain quality of life by minimizing impacts of this disease
- ◆ Preserve functional capacity by preventing complications
- ◆ Minimize risk of hypoglycemia
- ◆ Meet realistic weight goals
- ◆ Avoid glucose readings > 200mg/dl
- ◆ For frail elderly, aim for fasting or bedtime glucose > 100mg/dl
- ◆ Safety precautions are imperative to prevent falls

Acute Complications are common in the Elderly

- ◆ Increased frequency of infections (respiratory, skin, urinary)/ Foot infections can lead to amputations
- ◆ Difficulty healing of breaks in the skin even without infection
- ◆ Hyperglycemic Hyperosmolar Nonketotic Syndrome
- ◆ DKA, not rare
- ◆ Hypoglycemia related to sulfonylurea or insulin treatment, especially with declining renal function

Atypical Presentation of Hyperglycemia in the Elderly

- ◆ A vague sense of not feeling oneself.
- ◆ Electrolyte imbalance and dehydration (blunted sense of thirst).
- ◆ Incontinence (masking polyuria).
- ◆ Appetite loss (due to depression, GI disease, or drug side effects).
- ◆ Fatigue (“just getting old”) and gradual profound loss (unnoticed for months).

Diabetes Symptoms Often Present Differently in Frail Elderly

PATHOPHYSIOLOGIC STATE	TYPICAL PRESENTATION	COMMON PRESENTATION IN FRAIL ELDERLY
Hyperglycemia/ hyperosmolarity	Polydipsia	Impaired vision, confusion, dehydration
Catabolism due to lack of insulin	Polyphagia	Weight loss, anorexia
Increased urinary volume due to glucosuria	Polyuria	Incontinence

Drugs That May Worsen Hyperglycemia in the Elderly

- ◆ Glucocorticoids
- ◆ Thiazide diuretics
- ◆ Phenytoin
- ◆ Lithium and Phenothiazines
- ◆ Estrogens
- ◆ Growth Hormone
- ◆ Isoniazid and Sympathomimetic agents
- ◆ Sugar-containing medications

Altered Presentation of Hypoglycemia in the Elderly

- ◆ Adrenergic symptoms: sweating, nervousness, tremor
- ◆ Neuroglycopenic symptoms: confusion
- ◆ Elderly lose the adrenergic symptoms (loss of autonomic nerve function) and have more profound neuroglycopenic symptoms than the young: reversible hemiparesis.
 - ◆ This occurs late in the course of hypoglycemia.

Consequences of Severe Hypoglycemia:

- ◆ Tissue damage in elderly patients with impaired cardiac and cerebral circulation and serious chronic neurological consequences

- ◆ Exacerbation of ischemic heart disease with anginal symptoms
- ◆ Injuries including fractures
- ◆ Death caused by hypoglycemia or its consequences

Cause of Serious or Fatal Hypoglycemia

- ◆ Skipping meals or not eating enough
- ◆ Error in dosage of sulfonylurea or insulin agents (10% of SFU-related hypoglycemia patients die)
- ◆ Excessive activity or exercising with a low blood sugar
- ◆ Alcohol abuse associated with skipped meals

Contraindications of Tight Control in the Elderly

- ◆ Dementia
- ◆ Autonomic nerve dysfunction
- ◆ Physical disability
- ◆ Social isolation or food restriction
- ◆ Chronic renal insufficiency
- ◆ Cirrhosis

Goal: Decrease hyperglycemic symptoms and prevent hyperosmolar state

Monitoring in the Elderly

- ◆ Most elderly incorrectly perform glucose and urine tests.
- ◆ Blood glucose monitoring correlates to A1c and is a better tool for titrating insulin.
- ◆ Assess albuminuria to assess cardiovascular status and treat HTN/Lipids.
- ◆ Feet should be screened/treated vigorously.

Medical Nutrition Therapy Goals and Points of Consideration

- ◆ Individualize dietary modifications. Consider preferences and household.
- ◆ Minimize unnecessary restrictions.
- ◆ Vitamin and mineral supplements may be indicated. Talk to physician prior to starting any supplement.
- ◆ Minimal weight loss for obese can be very effective. Limit intake of saturated and trans fats as much as possible. Saturated fat should consist of less than 7% of the total calories*.
- ◆ Unless medically contradicted, encourage drinking 2 quarts of water per day.

* Diabetes Care, 2007 Jan; 30 Suppl 1 S11

- ♦ Recommend at least 20 grams of fiber per day to prevent constipation and reduce heart disease and cancer.
- ♦ Calcium intake should be encouraged. Those older than 70 years need 1,200 mg per day (32 ounces of milk equivalent).
- ♦ The recommended daily dose of Vitamin D and B-12 supplements for those over the age of 70 are 600 IU for Vitamin D and 2.4 micrograms for Vitamin B-12 (many elderly are unable to absorb Vitamin B-12 from food).
- ♦ Overdose of Vitamin A is more likely in the elderly, since Vitamin A is absorbed more readily and clears more slowly.
- ♦ Protein needs to make up greater part of elders' meal plans since they usually take in fewer calories.

Exercise in Older Adults

- ♦ Consider risks and benefits of specific activities.
- ♦ Conduct pre-exercise evaluation (medical evaluation, ECG, exercise stress testing).
- ♦ Start with low intensity; slowly increase activity.
- ♦ Range-of-motion exercises, walking and swimming are great choices.
- ♦ Perform some light weight lifting (strength building).

Diabetes-Associated Changes That Affect Teaching-Learning

- ♦ Sensory — (visual acuity, lens clarity, night vision, hearing)
 - ♦ Impaired seeing syringe marks, perceiving blue-tone colors, interpreting home glucose monitoring instruments
 - ♦ Impaired communication may lead to non-adherence
- ♦ Cognition — memory, complex psychomotor tasks
 - ♦ May need repetition or caretaker assistance
 - ♦ May have difficulty with insulin administration (mixing insulins and injection, site rotation) and glucose monitoring
- ♦ Cutaneous — skin vibratory and thermal sensitivity, tactile sensitivity
 - ♦ Impaired ability to discern temperature and pressure
 - ♦ Potential for unawareness of burns and ischemia
 - ♦ Decreased manual dexterity for injections and glucose monitoring
- ♦ Urinary — decreased renal function, altered renal threshold for glucose
 - ♦ Potential for hypoglycemia, increasing drug half-life
 - ♦ Decreased utility of urine testing

- ♦ Gustatory, Olfactory — taste, smell
 - ♦ Reduced dietary adherence
- ♦ Gastrointestinal — thirst mechanism, motility, delayed gastric emptying
 - ♦ Altered dietary intake
 - ♦ Potential for hypoglycemia and dehydration
- ♦ Vestibular-Proprioceptive-Equilibrium — sense of bodily orientation
 - ♦ Vertigo and imbalance, potential for falls
 - ♦ Decreased motivation for exercise/activity
- ♦ Limit other medications that can increase risk of falls:
 - ♦ Drowsiness
 - ♦ Dizziness
 - ♦ Urinary or fecal problems